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conclusion is reached that the seed deserves to be removed from *Cardiocarpon*, chiefly on account of its vascular structure, and therefore a new genus *Mitrospermum* is proposed. Whether the seed belongs to *Cordailes* or not was not determined, for the platysperm character can no longer be used as an indication of that group. Sections of unattached seeds must continue to be made, but there is far greater need of sections of attached seeds, for these will probably solve the puzzling embryo situation attributed to paleozoic seeds.—J. M. C.

Phototropism.—NORDHAUSEN¹⁵ offers more evidence against the lens theory of phototropic perception. He finds that leaves of *Begonia* with killed epidermis assume the normal light position, the palisade cells being the perceptive organs. He says that “the epidermis as well as its papillose character are not necessary for light perception.” He finds a great difference between the sensitiveness of the two halves of the leaves of *Tropaeolum*, which renders them unsuitable for comparing the effect of light on the wet and dry halves. This plant and method have furnished HABERLANDT with his best evidences for the lens theory. After offering this significant evidence against the theory, he states that HABERLANDT’S reply to his former criticism has not rendered that criticism any less applicable. He also holds that the evidence offered in HABERLANDT’S later papers is not of a sufficiently critical nature to give the theory any support.—WILLIAM CROCKER.

Carbon dioxid as a fertilizer.—A Berlin company has placed a product on the market known as “Germanol,” which consists of an earthy mixture containing about 18 per cent calcinated soda. The company attributes the virtue of this mixture to an increased porosity of the soil following an increase in the proportion of carbon dioxid. MITSCHERLICH,¹⁶ however, is of the opinion that if such a mixture has any value it must be attributed to the action of the carbon dioxid in increasing the solubility of various difficultly soluble soil substances. His comprehensive tests show that increasing the carbon dioxid content of the soil does not result in an increase of plant product; that there is always sufficient carbon dioxid in the soil to render mineral food available; that an increase in the carbon dioxid in the soil does increase the solubility of difficultly soluble substances, but that such increase is superfluous so far as any advantage to the plant is concerned.—RAYMOND H. POND.

Rhizophore of Selaginella.—WORSDELL¹⁷ has used an investigation of the rhizophore of *Selaginella* as the basis of a discussion of the ultimate morpho-

¹⁵ NORDHAUSEN, M., Ueber die Perzeption der Lichtsichtung durch die Blattspreite. Zeitschr. Bot. 2:465-506. 1910.

¹⁶ MITSCHERLICH, EILHARD ALFRED, Ein Beitrag zur Kohlensäuredüngung. Landwirtsch. Jahrb. 39:157-166. 1910.

¹⁷ WORSDELL, W. C., The rhizophore of *Selaginella*. New Phytol. 9:242-253. figs. 2. 1910.

logical categories. He believes that there are "three stereotyped, fixed categories of organs, viz., shoot, leaf, and root," and that there can be no others. "There can be no room in that region of the vegetable kingdom above the level of the homogeneous thalloid types for any organ which is neutral, intermediate, or undifferentiated in character." Incidentally the author furnishes proof, which he says is unequivocal, "that the normal rhizophore has the morphological value of a shoot." This conclusion we are ready to accept, in the absence of any better one, but it is late in the day to defend rigid categories, and to decide what can and what cannot be.—J. M. C.

New genus of flagellates.—GARDNER¹⁸ has described a new genus of flagellates (*Leuvenia*) whose unusual combination of morphological features prevents "any attempt at present to classify it, even to naming the family to which it belongs or in which it has its nearest affinities." The motile, growth, and palmella stages are known. In the growth and mature stages the nuclei and chromatophores are inconstant in number, and in the motile stages contractile vacuoles occur in both anterior and posterior ends, and "pyrenoids, gullet, and stigma are absent." The chromatophores divide by constriction, remain attached for some time by delicate cytoplasmic strands, and are irregular in shape and size.—J. M. C.

Diurnal periodicity in the nitrogen content of leaves.—Investigations hitherto have tended to establish a diurnal periodicity in the nitrogen content of leaves, the fluctuation showing a greater content in the morning than in the evening. CZAPEK, however, in his *Biochemie* states that such investigations should be more comprehensive. With a view to supplying this need, OTTO and KOOPER¹⁹ have made a comprehensive series of analyses which show that even in different stages of development leaves of several different species have a greater nitrogen content in the morning than in the evening. They also found a gradual decrease in the nitrogen content from spring to autumn.—RAYMOND H. POND.

New genera of Chlorophyceae.—GARDNER²⁰ has described two new genera of green algae growing in association with other marine algae of California. *Endophyton* (*E. ramosum*) is endophytic within the fronds of various species of red algae, and is referred to the Chroolepidae on account of the absence of hair cells, but it has close resemblances to the Chaetophoreae. *Pseudodictyon*

¹⁸ GARDNER, N. L., *Leuvenia*, a new genus of flagellates. Univ. Calif. Publ. Bot. 4:97-106. pl. 14. 1910.

¹⁹ OTTO, DR. R., and KOOPER, W. D., Beiträge zur Abnahme bezw. Rückwanderung der Stickstoffverbindungen aus den Blättern während der Nacht, sowie zur herbstlichen Rückwanderung von Stickstoffverbindungen aus den Blättern. Landwirtsch. Jahrb. 39:167-172. 1910.

²⁰ GARDNER, N. L., New Chlorophyceae from California. Univ. Calif. Publ. Bot. 3:371-375. pl. 14. 1909.